



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/014,218	10/22/2001	Pingfan P. Wu	980.1079US01	3038
22865	7590	06/01/2005	EXAMINER	
ALTERA LAW GROUP, LLC 6500 CITY WEST PARKWAY SUITE 100 MINNEAPOLIS, MN 55344-7704			LI, SHI K	
			ART UNIT	PAPER NUMBER
			2633	

DATE MAILED: 06/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/014,218

Applicant(s)

WU ET AL.

Examiner

Shi K. Li

Art Unit

2633

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 03 February 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-30 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 February 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 112*

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 8 and 21 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Claim 8 recites the limitation "wherein the polarized light includes odd channels and even channels, the phase retardation amount experienced by the odd channels differing from the phase retardation amount experienced by the even channels by an odd integer multiple of  $\pi/2$ ". However, the instant specification teaches in page 12, lines 14-16 that the even channels may have frequencies corresponding to the inflection points 620 while the odd channels have frequencies corresponding to the inflection points 625. Points 620 and points 625 differ by multiple of  $\pi$ . Nowhere does the instant specification teach that the phase retardation amount experienced by the odd channels differing from the phase retardation amount experienced by the even channels by an odd integer multiple of  $\pi/2$ . Therefore, claim 8 fails the enablement requirement. Claim 21 recites similar limitation that fails the enablement requirement.

### *Claim Rejections - 35 USC § 102*

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

Art Unit: 2633

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-2, 5-7, 9, 12-13, 17-20, 23, 27 and 29-30 are rejected under 35 U.S.C. 102(b) as being anticipated by Shibutani (U.S. Patent 5,107,512).

Regarding claims 1, 12, 19, 23 and 27, Shibutani discloses in FIG. 1 a light frequency stabilizing device comprising a birefringent body 21, a polarizer 22, optical detector 26 and electronic error circuit 29. Shibutani teaches in FIG. 2C that the beam from photodetector 26 is periodic. Since the signal generated by a photodetector is proportional to the intensity of the received light, the output of the photodetector is also periodic as a function of frequency. Shibutani teaches in FIG. 3 laser source 11 and feedback control circuit. Shibutani further teaches in FIG. 4 an optical communication system with a frequency stabilizing device. Inherently, an optical communication comprises an optical receiver.

Regarding claim 2, Shibutani teaches a single birefringent material segment.

Regarding claims 5 and 13, Shibutani teaches in col. 4, lines 61-65 that a polarization adjuster is used to adjust the direction of polarization such that the birefringent element has an optic axis direction oriented at an angle of  $45^\circ$  with the input light.

Regarding claims 6 and 17, Shibutani teaches in col. 4, line 49-53 that the polarizer is oriented with a direction at  $45^\circ$  with the birefringent element.

Regarding claims 7 and 20, Shibutani teaches in FIG. 2 and col. 5, lines 11-30 a plurality of frequency-distinct signals  $f(m-1)$ ,  $f(m)$  and  $f(m+1)$  wherein the phase retardation amounts experienced by them differ by  $\pi$ .

Art Unit: 2633

Regarding claims 9 and 18, Shibutani teaches in FIG. 2 that the phase retardation amount is a periodic function.

Regarding claims 29-30, Shibutani teaches in FIG. 2E that the feedback circuit provides the frequency control signal for stabilizing the laser to an inflection point of the periodic first signal.

5. Claims 1-3, 5-6, 8-15, 17-19, 21, 23-24 and 26-28 are rejected under 35 U.S.C. 102(b) as being anticipated by Leckel et al. (U.S. Patent 6,043,883).

Regarding claims 1, 12, 19, 23 and 27, Leckel et al. discloses in FIG. 1 a wavemeter comprising a birefringent element 1 for receiving an optical signal, a polarizer 2, a optical detector 3 and electric circuit 9 for generating a signal for adjusting wavelengths of the optical signal generated by laser source. Leckel et al. teaches in FIG. 5 that the output of the optical detector is periodic as a function of frequency. Leckel et al. teaches in FIG. 2 laser source 30 and feedback controller 33. Leckel et al. teaches col. 1, lines 14-15 that the laser source is part of a communication system comprising, in addition to the laser source (transmitter), an optical fiber and an optical receiver.

Regarding claim 2, Leckel et al. teaches in FIG. 1 a single birefringent material segment.

Regarding claims 3, 15 and 26, Leckel et al. teaches in FIG. 4 a birefringent element with a plurality of material segments.

Regarding claims 5 and 13, Leckel et al. teaches in col. 6, lines 30-33 that the retardation plate retards light with a polarization being parallel to the slow axis by  $\pi/4$  relative to light with a polarization being parallel to the fast axis.

Regarding claims 6 and 17, Leckel et al. teaches in col. 8, lines 59-60 that the polarizer is polarizes the incoming beam by  $45^\circ$ .

Regarding claims 8 and 21, Leckel et al. teaches in col. 7, lines 56-60 that beam  $I_1$  (odd channel) and beam  $I_2$  (even channel) have a relative phase shift of  $\pi/2$ .

Regarding claims 9 and 18, Leckel et al. teaches in FIG. 5 that the phase retardation amount is a periodic function.

Regarding claims 10-11, 14, 24 and 28, Leckel et al. teaches in FIG. 1 a second detector 5 and a beam splitter 6. The second optical detector is coupled to the electric circuit 9.

***Claim Rejections - 35 USC § 103***

6. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

7. Claims 3, 15 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shibutani (U.S. Patent 5,107,512) in view of Chen et al. (U.S. Patent 6,005,995).

Shibutani has been discussed above in regard to claims 1-2, 5-7, 9, 12-13, 17-20, 23, 27 and 29-30. The difference between Shibutani and the claimed invention is that Shibutani does not teach a birefringent element including a plurality of birefringent segments. Chen et al. teaches in FIG. 9A a device for use with frequency tuner or locker to discriminate wavelength. It comprises of a plurality of birefringent segments. One of ordinary skill in the art would have motivated to combine the teaching of Chen et al. with the frequency stabilizing device of Shibutani because the device of Chen et al. can be used for controlling ITU frequencies (see col. 4, lines 25-30). Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a birefringent element including a plurality of birefringent segments,

Art Unit: 2633

as taught by Chen et al., in the frequency stabilizing device of Shibutani because the device of Chen et al. can be used for controlling ITU frequencies.

8. Claims 4, 16 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shibutani (U.S. Patent 5,107,512) in view of Chang et al. (U.S. Patent 6,335,830 B1).

Shibutani has been discussed above in regard to claims 1-2, 5-7, 9, 12-13, 17-20, 23, 27 and 29-30. The difference between Shibutani and the claimed invention is that Shibutani do not teach a thermally compensated birefringent element. Chang et al. teaches in col. 6, lines 1-11 a thermally stable birefringent element comprising two segments each of which is of different material for compensating thermal effect of each other. One of ordinary skill in the art would have been motivated to combine the teaching of Chang et al. with the frequency stabilizing device of Shibutani because the birefringent assembly of Chang et al. provides improved thermal stability over a range of operating temperature. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a thermally stable birefringent element comprising two segments each of which is of different material for compensating thermal effect of each other, as taught by Chang et al., in the frequency stabilizing device of Shibutani because the birefringent assembly of Chang et al. provides improved thermal stability over a range of operating temperature.

9. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Leckel et al. (U.S. Patent 6,043,883) in view of Ukaji et al. (U.S. Patent 6,804,468 B1).

Leckel et al. has been discussed above in regard to claims 1-3, 5-6, 8-15, 17-19, 21, 23-24 and 26-28. The difference between Leckel et al. and the claimed invention is that Leckel et al. does not teach a transceiver. However, it is well known in the art to use transceiver to support

Art Unit: 2633

bi-directional traffic. For example, Ukaji et al. teaches in FIG. 2 transceiver 5 or transmitter/receiver pair 7 and 8 to support bi-directional traffic. One of ordinary skill in the art would have been motivated to combine the teaching of Ukaji et al. with the optical communication system of Leckel et al. because most traffic in telecommunication and data communication is bi-directional. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to include transceiver, as taught by Ukaji et al., in the optical communication system of Leckel et al. because most traffic in telecommunication and data communication is bi-directional.

#### ***Response to Arguments***

10. Applicant's arguments with respect to claims 1-30 have been considered but are moot in view of the new ground(s) of rejection.

#### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shi K. Li whose telephone number is 571 272-3031. The examiner can normally be reached on Monday-Friday (8:30 a.m. - 5:00 p.m.).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on 571 272-3022. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.



Art Unit: 2633

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

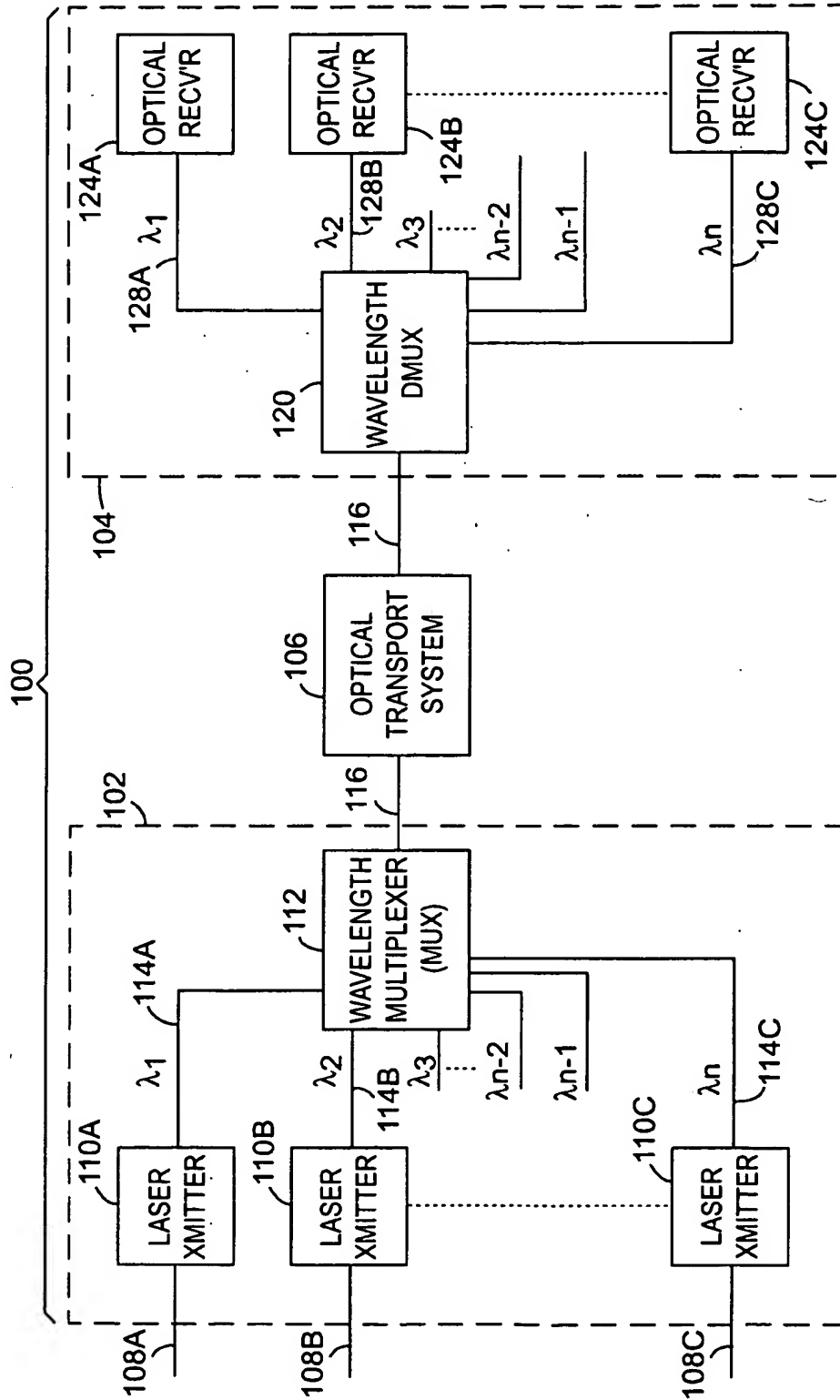
skl  
27 May 2005



**Shi K. Li**  
**Patent Examiner**



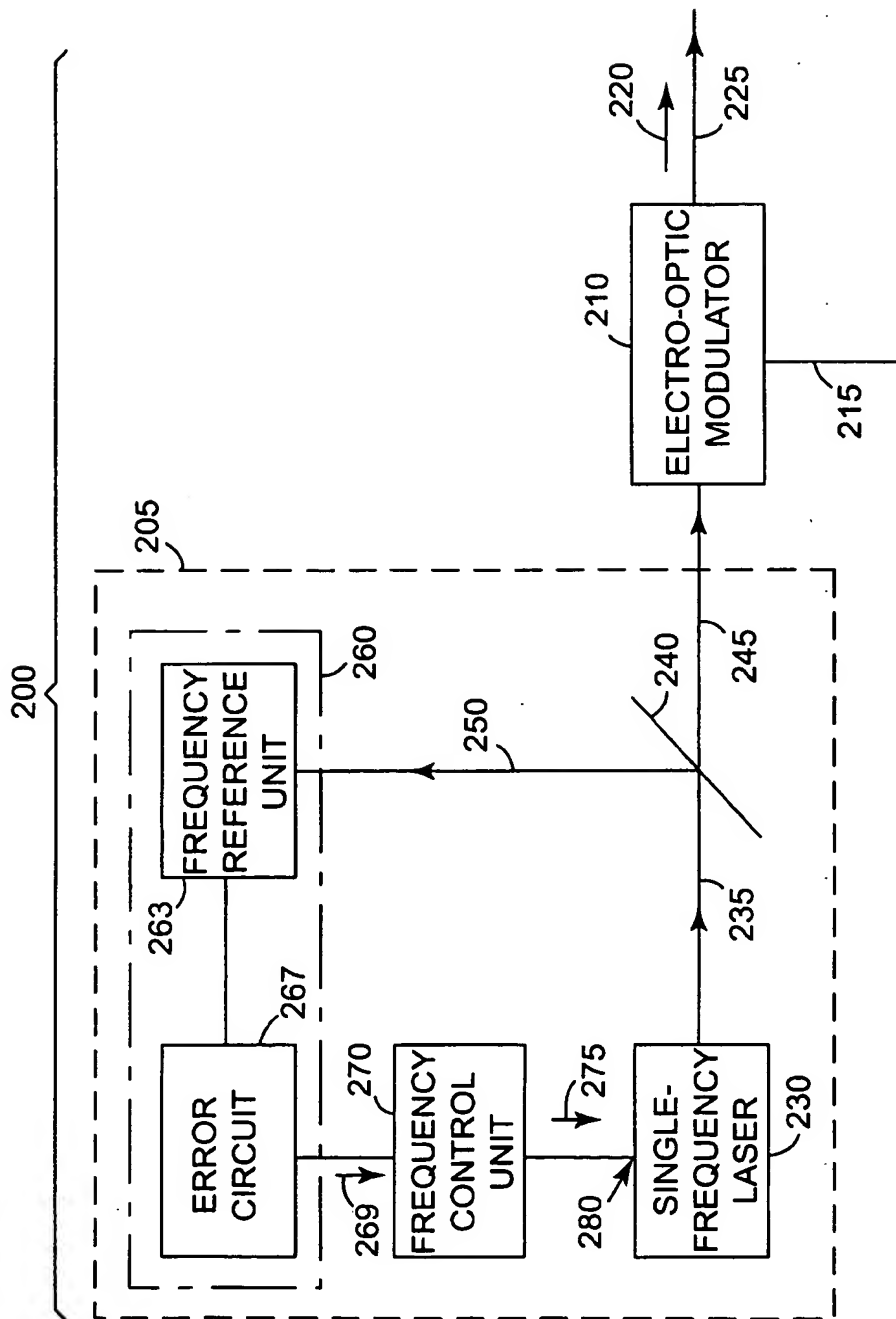
5/27/05



**Fig. 1**  
PRIOR ART



5/22/05



**Fig. 2**  
PRIOR ART



5/27/05

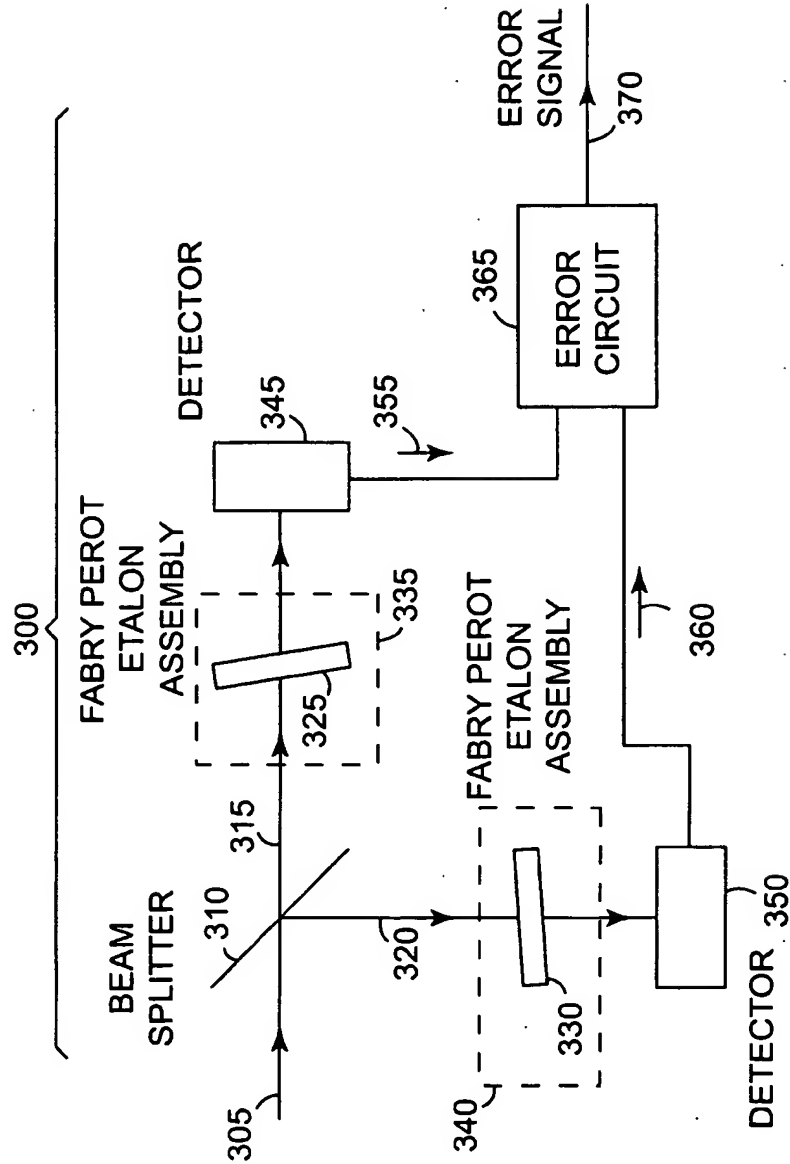


Fig. 3  
PRIOR ART